AMENDMENTS TO THE CLAIMS

Claim 1 (Previously presented): A method for the treatment of infection by a microorganism in a biological environment from where the microorganism acquires iron, heme or porphyrin said method comprising administering to said environment an effective amount of an agent for a time and under conditions sufficient to antagonize the interaction between a molecule derived from said microorganism having an HA2 domain and an HA2-binding motif on a porphyrin containing molecule present in said biological environment, wherein the agent antagonizes the interaction between the molecule derived from said microorganism having the HA2 domain and the HA2-binding motif on the porphyrin containing molecule by specifically binding to one or both of (a) the HA2 domain of the molecule, and (b) the HA2-binding motif on the porphyrin containing molecule.

Claim 2 (Original): A method according to Claim 1 wherein the microorganism is *Porphyromonas gingivalis* or a related microorganism.

Claim 3 (Previously Presented): A method according to claim 1 wherein the biological environment is a mammal or reptile or insect or bird or species of fish.

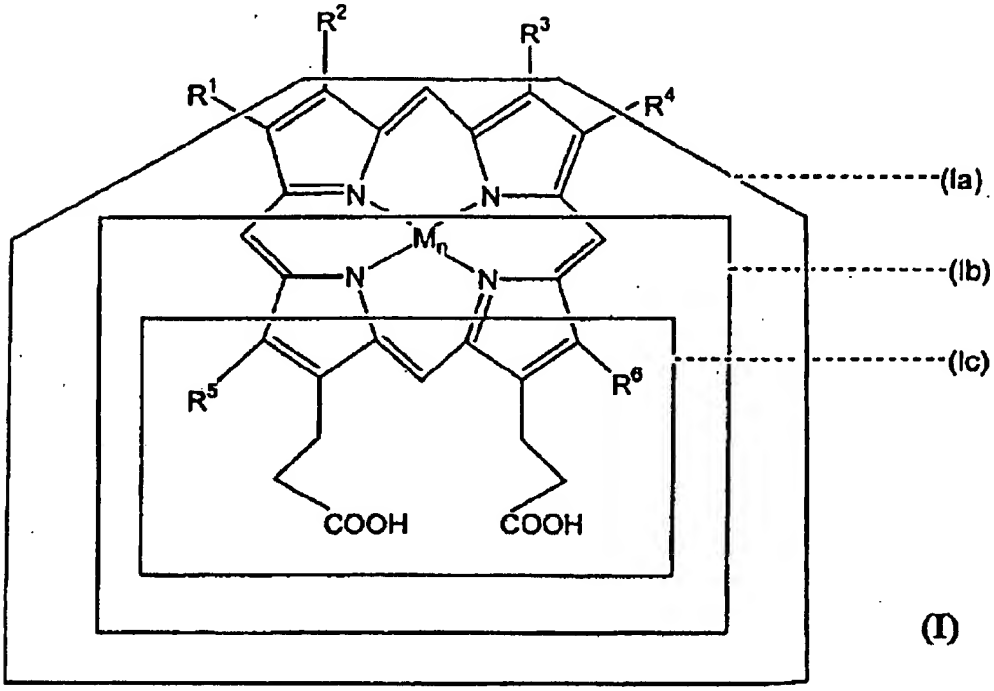
Claim 4 (Original): A method according to Claim 3 wherein the mammal is a primate, human, livestock animal or a companion animal.

Claim 5 (Original): A method according to any one of Claims 1 to 4 when used for the treatment of a disease condition in the oral cavity, nasopharynx, oropharynx, vagina or urethra or other vascular or mucosal regions or cavities or in the hooves of livestock animals.

Claim 6 (Previously presented): A method according to any one of Claims 1 to 4 wherein the HA2-containing molecule is a gingipain, an hagA gene product or a TonB-dependent protein or a homologue thereof.

Claim 7 (Previously Presented): A method according to Claim 1 wherein the porphyrin moiety is a heme.

Claim 8 (Currently Amended): A method according to Claim 7 wherein the HA2-binding motif comprises a region comprising or within substructure (Ic) of structure (I):



(I)

wherein R_1 and R_6 are the same or different and each is an alkyl such as a methyl, ethyl or propyl group, or hydrogen, hydroxyl, carboxyl, aldehyde, acetaldehyde or keto group, M is a metal ion in various oxidation states and is optionally present such that n is 0 or 1 or a structurally or functional homologue thereof.

Claim 9 (Currently Amended): ~~A method~~ The method according to claim 1 ~~for the treatment of infection by a microorganism in a mammal, said microorganism substantially requiring exogenous iron, heme or porphyrin for growth or maintenance wherein said method comprises administering to said mammal an effective amount of an agent for a time and under conditions sufficient to antagonize the interaction between a molecule derived from said microorganism and having an HA2 domain and an HA2 binding moiety on a porphyrin containing molecule and~~ wherein said HA2 domain comprises:

(i) an amino acid sequence substantially encoded by the nucleotide sequence set forth in SEQ ID NO:5 or a nucleotide sequence having at least about ~~40% similarity~~ 90% identity thereto or capable of hybridizing thereto under [[low]] stringency conditions ~~comprising from at least about 0 to at least about 15% v/v formamide and from at least about 1M to at least about 2M salt~~ of 0.1xSSC, and 0.1% w/v SDS at 65 °C; and/or

(ii) an amino acid sequence substantially as set forth in SEQ ID NO:6 or an amino acid sequence having at least about [[40%]] 90% similarity thereto ~~or at least about 20% identity after optimum alignment with same sequence;~~

~~wherein said amino acid sequence is capable of interacting with an HA2 binding moiety on a porphyrin containing molecule such as but not limited to hemoglobin or a precursor form thereof or part thereof such as heme, and~~

~~further wherein the agent antagonizes the interaction between the molecule derived from said microorganism having the HA2 domain and the HA2 binding motif on the porphyrin containing molecule by specifically binding to one or both of (a) the HA2 domain of the molecule, and (b) the HA2 binding motif on the porphyrin containing molecule~~.

Claim 10 (Currently Amended): A method for treatment of periodontal, pulmonary, vaginal, urethral or hoof disease resulting from infection by *P. gingivalis* or related microorganism in a mammal said method comprising administering to said mammal an effective amount of a agent

for a time and under conditions sufficient to antagonize the interaction between a *P. gingivalis*-derived molecule having an HA2 domain and an HA2-binding motif on hemoglobin, wherein the agent antagonizes the interaction between the *P. gingivalis*-derived molecule having the HA2 domain and the HA2-binding motif on the hemoglobin by specifically binding to one or both of (a) the HA2 domain of the *P. gingivalis*-derived molecule, and (b) the HA2-binding motif on the hemoglobin.

Claim 11 (Currently Amended): A method for the treatment of *P. gingivalis* infection or infection by a related microorganism in a mammal, said method comprising administering to said mammal an effective amount of an agent for a time and under conditions sufficient to antagonize the interaction between a *P. gingivalis*-derived HA2-containing molecule comprising the amino acid sequence ALNPDNYLISKDVTG (SEQ ID NO:1) or ALNPDNYLISKDVTGATKVKY (SEQ ID NO:8) or an amino acid sequence having at least [[40%]] 90% similarity to SEQ ID NO:1 or SEQ ID NO:8 ~~or at least about 20% identity after optimum~~ after optimal alignment with the same sequence or an amino acid sequence encoded by the nucleotide sequence-SEQ ID NO:7 or a nucleotide sequence having at least ~~40% similarity~~ 90% identity thereto or a nucleotide sequence capable of hybridizing thereto under [[low]] high stringency conditions and an HA2-binding motif comprising and including propionic acid groups or anionic or salt forms thereof, wherein the agent antagonizes the interaction between the *P. gingivalis*-derived HA2-containing molecule and the HA2-binding motif by specifically binding to one or both of (a) the HA2 domain of the *P. gingivalis*-derived molecule, and (b) the HA2-binding motif.

Claims 12-17 (cancelled)

Claim 18 (Previously Presented): A method according to claim 5 wherein the HA2-containing molecule is a gingipain, an hagA gene product or a TonB-dependent protein such as but not limited to Tla protein or a homologue thereof.

Claim 19 (Previously Presented): A method according to claim 6 wherein the porphyrin moiety is a heme.

Claim 20 (Cancelled).

Claim 21 (Previously presented): A method according to claim 6, wherein the TonB-dependent protein is a Tla protein.

Claim 22 (Previously presented): A method according to claim 8, wherein the metal ion M in various oxidation states is selected from the group consisting of Fe, Fe^{++} and Fe^{+++}.

Claim 23 (Previously presented): A method according to claim 9, wherein the molecule derived from said microorganism and having an HA2 domain and an HA2-binding moiety on a porphyrin-containing molecule is hemoglobin or a precursor form thereof or part thereof or heme.

Claim 24 (Previously presented): A method according to claim 11, wherein the HA2-binding motif comprising and including propionic acid groups or anionic or salt forms thereof is defined by substructure (Ic) in Formula (I) on a porphyrin-containing molecule.

Claim 25 (Previously presented): A method according to claim 24, wherein the porphyrin-containing molecule is hemoglobin or a precursor form thereof or part thereof or heme.